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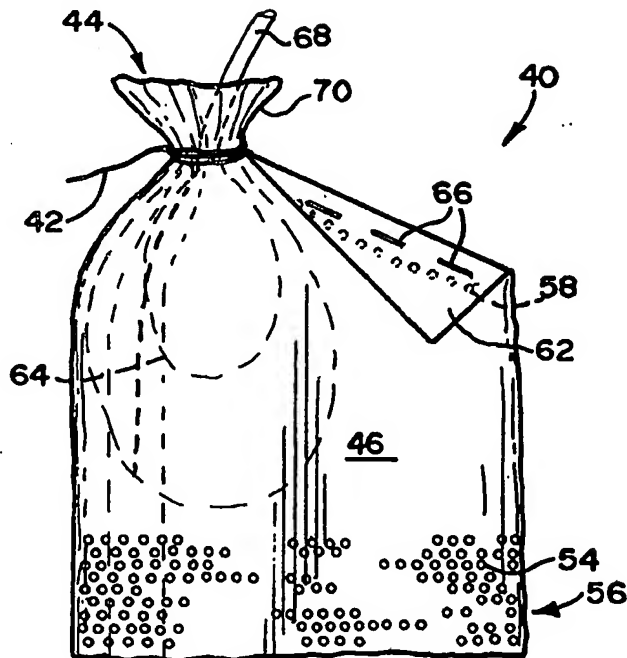
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<p>(21) International Application Number: PCT/US98/09611</p> <p>(22) International Filing Date: 13 May 1998 (13.05.98)</p> <p>(30) Priority Data: 97/4121 13 May 1997 (13.05.97) ZA</p> <p>(71) Applicant (for SD only): HANDELMAN, Joseph, H. [US/US]; 26 West 61st Street, New York, NY 10023 (US).</p> <p>(71)(72) Applicant and Inventor (for all designated States except SD): OOSTHUYSE, Steven, Andrew [ZA/ZA]; Plot 33, Hamawasha, District Tzaneen, 0850, Northern Province (ZA).</p> <p>(74) Agents: HANDELMAN, Joseph, H.; Ladas &amp; Parry, 26 West 61st Street, New York, NY 10023 (US) et al.</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report.</p>

(54) Title: FRUIT TIE BAG

(57) Abstract

A protective bag (10) for use in growing fruit (26) includes an integral tie means (24) for tying to a stalk (28) of the fruit. The invention also provides a method of securing a fruit bag to an individual fruit.



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## FRUIT TIE BAG

This invention relates to the growing of fruit. More particularly, this invention relates to a protective bag for use in growing fruit and to a method of securing a fruit bag to an individual fruit.

In this specification, the term fruit includes, unless the context clearly indicates otherwise, any seed bearing organ which is produced by a plant. It will therefore include fruits such as tomatoes, cucumbers, egg plant, or the like, which may sometimes be referred to as vegetables.

According to a first aspect of the invention, there is provided a protective bag for use in growing fruit, which includes an integral tie means for tying to a stalk of the fruit.

The tie means may extend from an open end of the bag. The tie means may be in the form of string, which extends from a corner of the bag. The string may be secured down the length of the bag.

An inner surface of the bag may be coated with a hydrophobic material. The protective bag may be formed of a composite material which includes a layer of cellulosic material, with the inner coating of hydrophobic

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material comprising a synthetic plastics material in the form of polyethylene.

In one embodiment of the invention, the bag is formed of sheet material consisting of kraft paper or white low density paper coated with polyethylene. The paper may have a unit weight of between 28 g to 40 g per m<sup>2</sup> and the polyethylene coating may have a unit weight of between 9 g to 15 g per m<sup>2</sup>.

The protective bag may be formed of a reflective material having a colour which enhances reflection of the sun's rays. In a preferred embodiment of the invention, the colour of the bag is white. Alternatively, the bag may be manufactured of glycine or rice paper.

At least one fold line may be defined at an open end of the bag for folding back a portion of the open end in order to close off that part of the open end in use. The portion may be in the form of a flap.

The protective bag may include a plurality of perforations which are defined in at least one of the sides of the bag for allowing flow of substances through the bag. The perforations may be positioned at a lower end of the bag. Further perforations may be provided at an upper end of the bag for allowing flow of air from the lower end of the bag towards the upper end of the bag. The perforations at the upper end of the bag may be provided below the fold line so

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that the perforations will be covered by the flap in use. The size of the perforations may be in the order of between about 0,1mm and 1mm.

The fruit may be a mango, which may be covered from an early stage of its development when it is about the size of a marble or that of a golf ball until it is ripe.

According to a second aspect of the invention, there is provided a method of securing a fruit bag to an individual fruit, the method including the steps of

inserting the fruit in the bag;

closing off at least a first portion of an open end of the bag so that a stalk of the fruit protrudes through a second portion of the open end; and

tying the second portion of the open end to the stalk with a tie means, so that the fruit is substantially enclosed in the bag.

The step of closing off the first portion may include the step of folding over a triangular portion of the open end and securing it in position. The triangular portion may be secured in position by means of stapling it to a side of the bag or by means of an adhesive material.

According to a third aspect of the invention, there is provided a protective bag for use in growing fruit which includes

a sheet formed of flexible material which is folded over to form two panels,

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the panels being sewn together with sewing yarn along two transversely spaced, longitudinally extending side edges to form side seams, with an opening defined at one end

between the side seams; and

a tie means formed by means of free ends of the sewing yarn on either side of the opening.

According to a fourth aspect of the invention, there is provided a method of fabricating a bag for use in protecting growing fruit which includes the steps of

folding a sheet of flexible material so that opposite ends of one side of the sheet abut;

sewing the sheet with sewing yarn along two transversely spaced longitudinally extending side edges, thereby forming an opening between the abutting ends; and

forming a tie means by means of free ends of the sewing yarn on at least one side of the opening.

The bag may be made in various sizes depending on the size of fruit.

The invention is now described by way of example with reference to the accompanying diagrammatic drawings.

In the drawings,

Figure 1 shows a schematic, three-dimensional view of a protective bag in accordance with a third aspect of the invention, for use in growing fruit;

Figure 2 shows a schematic side view of the bag shown in Figure 1, in use;

Figure 3 shows a side view of a protective bag in accordance with a first aspect of the invention, for use in growing fruit;

Figure 4 shows a further side view of the bag of Figure 3; and

Figure 5 shows a schematic three-dimensional view of the bag shown in Figures 3 and 4, in use.

Referring to Figures 1 and 2 of the drawings, the reference numeral 10 generally designates a protective bag, in accordance with the invention, for use in growing fruit.

The bag 10 includes a body 12 formed of a sheet of sheet material which is folded in half to form two panels 14. The panels 14 are sewn together with sewing yarn 16 along two transversely spaced, longitudinally extending side edges 18 to form side seams 20. The sheet material consists of kraft paper externally coated with polyethylene.

An opening 22 is defined at one end of the bag 10 between the side seams 20. A tie means or tie 24 is formed on either side of the opening 22 from knotted ends of the sewing yarn 16.



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In use, the bag 10 is located over an individual fruit such as a mango 26, when the mango 26 is then at an early stage of its development and about the size of a golf ball. The opening 22 of the bag 10 is closed off by gathering the panels 14 around a stem 28 of the mango 26. The bag 10 is secured to the stem by securing the ties 24 around the stem 28. The bag 10 is left around the mango 26 until it is ripe and ready to be picked as shown by reference numeral 30.

Referring now to Figures 3, 4 and 5 of the drawings, a protective bag for use in growing fruit, in accordance with the first aspect of the invention, is generally indicated by reference numeral 40.

The protective bag 40 includes an integral tie means in the form of a string 42 which extends from an open end 44 of the bag 40. The bag 40 includes a first side 46 as shown in Figure 3 of the drawings and a second side 48 as shown in Figure 4 of the drawings. The bag 40 is formed of a rectangular panel of a cellulosic material such as paper, having an inner surface which is coated with a hydrophobic material (not shown). Ends 50 and 52 of the panel of material overlap and are secured to each other by means of an adhesive material (not shown). And end 42.1 of the string 42 is secured down the length of the bag 40 between the overlapping ends 50 and 52.

A plurality of perforations 54 are defined at the lower end 56 of the bag 40. It will be appreciated that in use, a fruit such as mango gives off water

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which collects in the lower end 56 of the bag 40. The perforations 54 therefore allows flow of accumulated water from the bag 40. A further row of perforations 58 is defined on the side 46 of the bag 40 approximate the open end 44 of the bag to allow flow of air via the perforations 54 through the bag and out of the perforations 58.

A triangular flap 62 is defined at the open end 44 of the bag 40 by fold line 60.

In use, a fruit such as a mango 64 is inserted into the bag 40, when the mango 64 is at an early stage of its development and about the size of a golf ball. The triangular flap 62 of the bag 40 is closed off by folding the flap over so that it abuts the side 46 of the bag 40. The flap 62 is secured in position by means of staples 66, with a pedicel or peduncle (fruit stalk) 68 of the mango 64 protruding through a second portion 70 of the open end 44 of the bag 40. The second portion 70 of the open end 44 is then tied to the stalk 68 by means of the string 42, so that the mango 64 is substantially enclosed in the bag 40.

The applicant believes that the advantages of the invention are that the bag protects the fruit from insects, fungal spore infection, solar injury, wind damage, hail, sap spurt at harvest, and bacterial infections.

**CLAIMS:**

1. A protective bag for use in growing fruit, which includes an integral tie means for tying to a stalk of the fruit.
2. The protective bag as claimed in Claim 1, in which the tie means extends from an open end of the bag.
3. The protective bag as claimed in Claim 2, in which the tie means is in the form of string.
4. A protective bag as claimed in Claim 3, in which the string extends from a corner of the bag.
5. The protective bag as claimed in Claim 4, in which the string is secured down the length of the bag.
6. The protective bag as claimed in Claim 1, in which an inner surface is coated with a hydrophobic material.

7. The protective bag as claimed in Claim 6, in which the bag is formed of a composite material which includes a layer of cellulosic material, with the inner coating of hydrophobic material comprising a synthetic plastics material.
8. The protective bag as claimed in Claim 7, in which the synthetic plastics material is polyethylene.
9. The protective bag as claimed in Claim 1, which is formed of a reflective material having a colour which enhances reflection of the sun's rays.
10. The protective bag as claimed in Claim 9, in which the colour of the bag is white.
11. The protective bag as claimed in Claim 1, in which the fruit is a mango.
12. The protective bag as claimed in Claim 1, in which at least one fold line is defined at an open end of the bag for folding back a portion of the open end in order to close off that part of the open end in use.
13. The protective bag as claimed in Claim 12, in which the portion is in the form of a flap.

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14. The protective bag as claimed in Claim 1, which includes a plurality of perforations which are defined in at least one of the sides of the bag for allowing flow of substances through the bag.

15. The protective bag as claimed in Claim 14, in which the perforations are positioned at a lower end of the bag.

16. A method of securing a fruit bag to an individual fruit, the method including the steps of

inserting the fruit in the bag;

closing off at least a first portion of an open end of the bag so that a stalk of the fruit protrudes through a second portion of the open end; and

tying the second portion of the open end to the stalk with a tie means, so that the fruit is substantially enclosed in the bag.

17. The method as claimed in Claim 16, in which the step of closing off the first portion includes the step of folding over a triangular portion of the open end and securing it in position.

18. The method as claimed in Claim 17, in which the triangular portion is secured in position by means of stapling it to a side of the bag.

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19. The method as claimed in Claim 17, in which the triangular portion is secured in position by means of an adhesive material.

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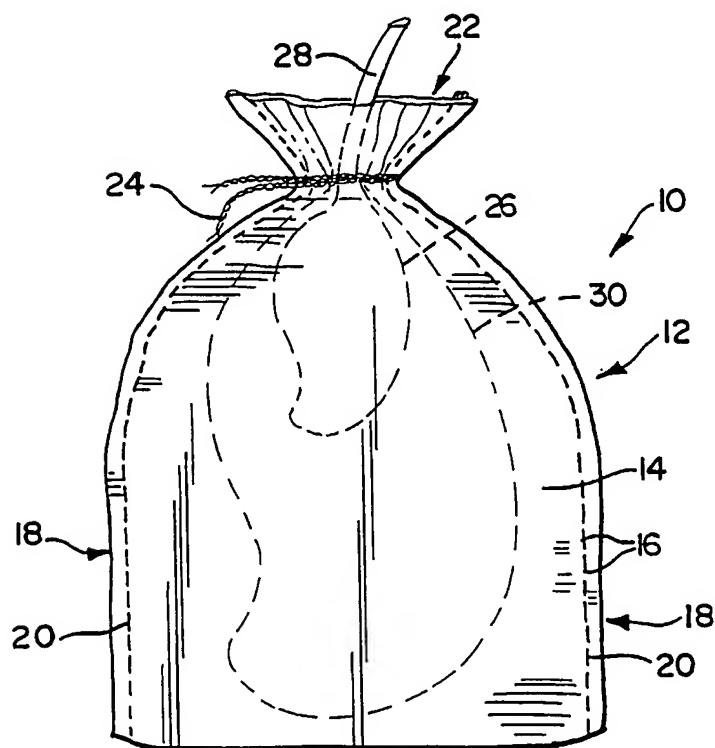
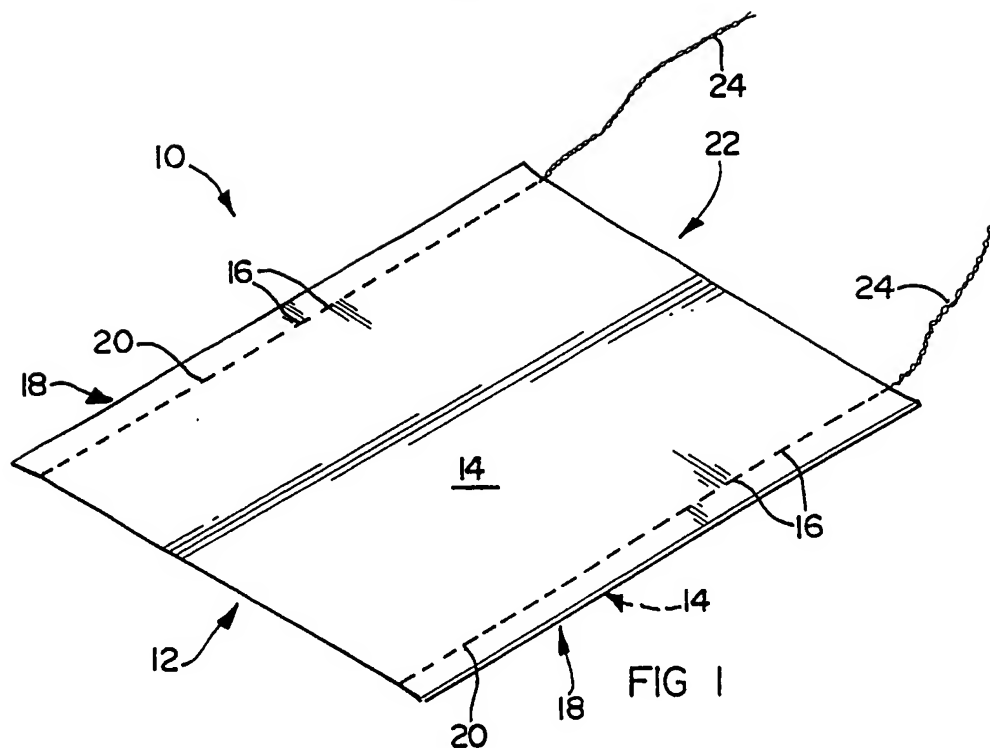


FIG 2

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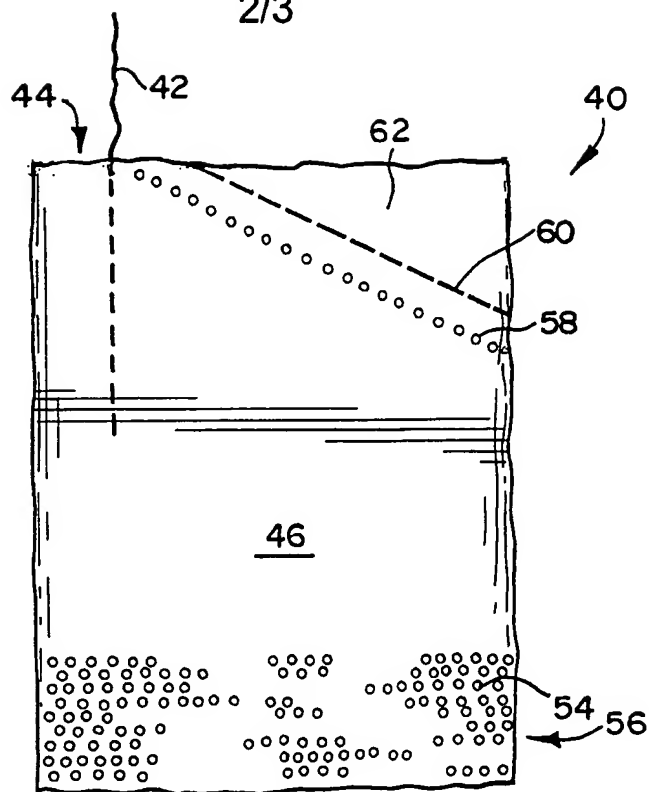


FIG 3

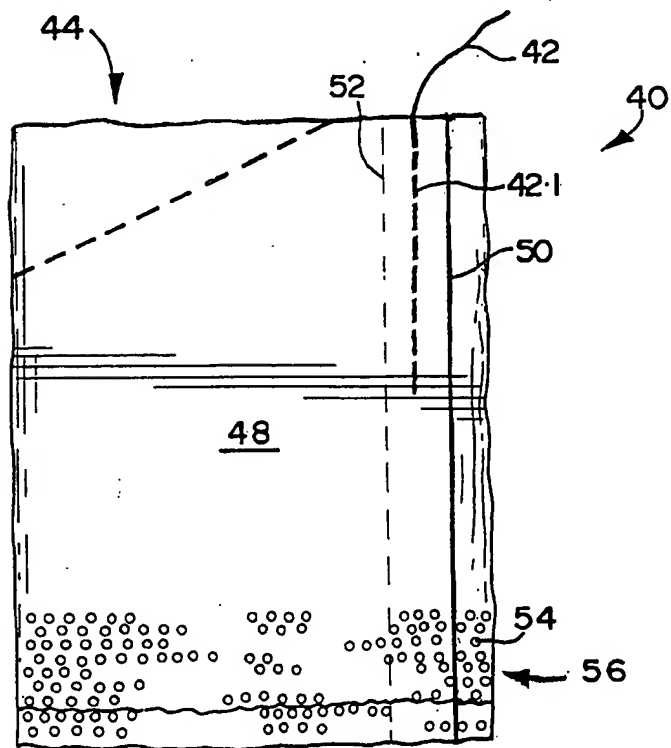


FIG 4



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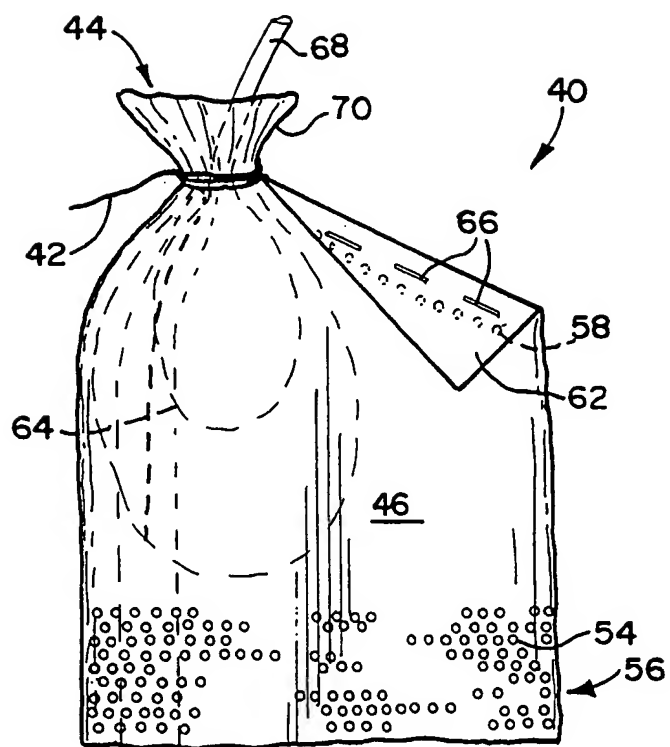


FIG 5

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US98/09611

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(6) :B65D 33/16

US CL :383/71

According to International Patent Classification (IPC) or to both national classification and IPC

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**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 946,897 A (FREEMAN) 18 JANUARY 1910, see entire document.	1,2,12,13, 16,17 ----- 3,6-11,14, 15,18,19
X -- Y	US 5,535,543 (ALEXANDER) 16 JULY 1996, see entire document.	1-3 ----- 6-8,11
Y	US 1,291,974 A (McNEIL) 21 JANUARY 1919, see entire document.	18
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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 331,357 A (WINEBERGER) 01 DECEMBER 1885, see entire document.	5
X	US 3,107,842 A (GUILFOYLE) 22 OCTOBER 1963, see entire document.	1-5
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Y		9,11,14-15
Y	US 4,646,467 A (MORRISROE) 03 MARCH 1987, see entire document.	9,10
A	US 4,698,226 A (GUTHRIE) 06 OCTOBER 1987, see entire document.	1-16
X	US 383,327 A (STARR) 22 MAY 1888, see entire document.	1-3,6-8,14,15
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Y		9-11,19

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383/71,72,88,89,102,109,113,116; 229/87.08; 426/106,118,410,415,418,419